Statement of Basis

July 12, 2011

Midroc Operating Company—
Cedar Creek, Area No. 8 Oil & Gas Production Wells

Facility No. 103-0031

Off of US Highway No. 84
Cohasset, Conecuh Co., AL

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Authority

The initial Title V Major Source Operating Permit is issued under the provisions of ADEM Admin. Code R. 335-3-16. The above named applicant has requested authorization to perform the work or operate the facility shown on the application and drawings, plans, and other documents attached hereto or on file with the Air Division of Alabama Department of Environmental Management, in accordance with the terms and conditions of this permit.

This initial Major Source Operating Permit will cover thirteen (13) onshore oil and gas production wells. These wells are located in Sections 13, 14, 15, 22, 23, and 24, south of US Highway No. 84 near Cohasset, AL.

Recommendations

This Statement of Basis indicates that these sources should meet the requirements of all federal and state rules and regulations, as described on the following pages. Therefore, I recommend that Midroc be issued the initial Major Source Operating Permit No. 103-0031 for these sources.

Joel K. Sutton
Industrial Minerals Section
Energy Branch
Air Division

July 12, 2011
Date

Permit Grouping Methodology

EPA currently has no official guidance pertaining to the permitting of oil and gas production sites, either as groups, or individually. The last document that addressed this topic was released in January 2007. This document, now rescinded, advised that surface production sites should be permitted separately.

When permitting oil and gas production wells the Department has considered the proximity of a wellsite to other wellsites under the same ownership/operatorship. This is clearly more stringent than EPA's advice in the now-rescinded guidance document mentioned.

Initially, the Department began permitting four square-mile sections, and denoting them, "Areas". For convenience and simplicity, these "Area" borders followed Township Section lines. The Department later altered this to follow the "Sensible Grouping" rule applied to compressor stations. Thus, all wells within one mile of each other are to be permitted together, and emissions aggregated for the purpose of determining the applicability of Title V Regulations and Prevention of Significant Deterioration [PSD] regulations. Township sections are still used as the primary building block in permitting the well groupings, although there is now no restriction on the Area size.

One of the challenges of permitting these sites is that the drilling schedule is a variable. Thus, it is difficult for the Permittee to predict where the next drilling site will be, and in what order these sites will be drilled. In order to streamline the permitting process, the Department has allowed owners/operators to apply for a finite number of wells, even if all of the exact sites are unknown. This allows the owner/operator some flexibility in the development of the field, while still ensuring that permits are issued. Emissions from these "Generic Wells" are counted towards the total Area potential emissions. This method works since each site has approximately the same equipment [(1) 0.5 MMBTU/hr heater treater, (1) flare stack, (2) condensate storage tanks, (1) salt water storage tank, and (1) power oil storage tank]. As part of the Temporary Authorization to Operate request, the owner/operator is required to submit the name of the wellsite, along with the UTM coordinates.

Facility History

Midroc Operating Company purchased the 30-1 Well in Area No. 1 [Facility No. 103-0011] in November 2000. Since then, Midroc has drilled, and is operating, 40-50 wells in southeast Conecuh County. Development of the field continues.

In September 2009, Midroc was issued a No Permit Determination letter for the 23-3 Well, since this well was more than one mile from any existing or proposed Midroc well. In April 2010, Midroc was issued a second No Permit Determination letter for the combined emissions from the 14-14, 22-8, and 23-3 Wells. In May 2010, Midroc was permitted for a total of thirteen (13) wells that are in an Area that is more than one mile from any existing or proposed Midroc well. Since Midroc had seven such Areas at the time, this grouping was denoted Area 8. Three (3) of the thirteen (13) wells were the 14-14, 22-8, and 23-3, with the other ten (10) being labeled "Generic". Since then, Midroc has drilled five (5) new wells: 13-13, 14-15, 22-16, 23-2, and 23-12. The 23-2 and 14-15 wells share a wellpad and flare, and the 23-12 gas is produced with the equipment constructed for the 22-8 well, since the 22-8 Well produced only briefly. A natural gas-fired power oil pump engine was used briefly at the 13-13 well.

In Table 1 summarizes the permit history of this facility:

Issuance Date	Permittee	Permit Type	Permit No.	Unit(s) Permitted
6/4/2010	Midroc Operating Co.	Air	X002	Engine for Well site 13-13 [Now Void]
5/11/2010	Midroc Operating Co.	Air	X001	Permit for (13) Wellsites
4/1/2010	Midroc Operating Co.	No Permit Letter		Letter regarding (3) Wellsites 14-14, 22-8, & 23-3
9/9/2009	Midroc Operating Co.	No Permit Letter		Letter regarding (1) Wellsite 23-3

Table 1: Facility Permit History

Critical Dates

This Area has been operating under Air Permits since April 1, 2010. Per ADEM Rule 335-3-16-.04(2), a facility operating under an Air Permit that is a Major Source with respect to Title V is required to submit a permit application within 12 months of commencing operation. Thus, a permit application was due June 1, 2011. The Permittee submitted the permit application on May 12, 2011. Additional information was received on May 23, 2011.

Process Description

There are two related processes for each well which will be covered by Major Source Operating Permit No. 103-0031.

Process No. 1—Oil & Gas Extraction:

Oil and associated sour gas flows from a well into a low pressure separator. In the process, the primary separation of gas and liquids from the well occurs in the separator. After the separator, the gas goes to the sour gas flare or to the nearby gas plant located in Midroc's Cedar Creek, Area No. 1 (Facility No. 103-0011). The liquids leave the separator and pass through a heater treater which primarily separates oil and water which flow into the storage tanks until sale or custody transfer. A Vapor Recovery Unit (VRU) is used to capture stock tank vapors and send the vapors to the gas plant (Facility 103-0011) or the onsite well flares. An electric power oil pump motor is used to pump oil from one of the tanks back into the ground in order to facilitate the extraction process.

Process No. 2—Oil Extraction:

In the event that the gas plant is offline or the well is not connected to the gas plant via a pipeline, these wells may be used to produce oil. This process is similar to the oil and gas extraction process except that the gas is continuously flared.

The following pages outline the regulations which apply to the various pieces of equipment at each wellsite. Each well is equipped with one (1) heater treater, one (1) emergency flare, one (1) salt water storage tank, and two (2) crude oil storage tanks. Each well is also permitted for one (1) power oil storage tank.

No site is equipped with an internal combustion engine.

Heater Treaters

There are twelve (12) existing and proposed heater treaters located throughout this Area. Each heater treater is to be rated at 0.5 MMBTU/hr, and boiler burn only natural gas, with propane as a secondary fuel. Each heater treater helps with the initial separation of the gas, liquid, and water components of the produced well stream.

Regulatory Applicability:

This section will summarize the regulatory applicability for these units.

Prevention of Significant Deterioration [PSD]
This facility is a 250-Ton source for the purposes of PSD since it is not one of the 28 source categories. Even though the facility as a whole has a limit to be a synthetic minor source with respect to PSD, none of these heaters has a limit assigned by this regulation.

ADEM Administrative Code Rule 335-3-4-.03
This regulation requires all indirect heating units located in Conecuh County to meet a limit of 0.5 lb Particulate Matter/MMBTU Heat Input, or 2.0 lb/SO_2/hr/heater. However, the combustion of natural gas would result in minimal Particulate Matter emissions.

ADEM Administrative Code Rule 335-3-5-.01(1)
This regulation requires all indirect heating units located in Conecuh County to meet a limit of 4.0 lb SO_2/MMBTU Heat Input, or 2.0 lb/SO_2/hr/heater. Fuel for this unit would be pipeline-quality natural gas, which would result in minimal SO_2 emissions.

40 CFR 60 Subpart D_C [NSPS D_C]
Per §60.40c(a), this regulation applies to steam generating units rated between 10 MMBTU/hr and 100 MMBTU/hr. Since these units are classified as process heaters, and are rated below 10 MMBTU/hr, this regulation does not apply.

40 CFR 63 Subpart DDDDD [MACT DDDDD]
This regulation was promulgated on March 21, 2011, and applies to facilities that are major sources of Hazardous Air Pollutants [HAPs]. Since this facility is not a major source of HAPs, this regulation does not apply.

40 CFR 63 Subpart JJJJJ [MACT JJJJJ]
This regulation was promulgated on March 21, 2011, and applies to boilers located at Area Sources of HAPs. Since these units are classified as process heaters, this regulation does not apply.

Title V
These units are subject to this regulation. However, according to the Trivial and Insignificant Activities list (Section 2, Part A), any fuel burning equipment with a rating between 0.5 MMBTU/hr and 5 MMBTU/hr is considered trivial and insignificant, provided it is not subject to an NSPS or a MACT regulation, and is located at a Title V facility. None of these heating units fall within this rating range, and no MACT

regulations or NSPS regulations apply to any of these heating units. Therefore, all of these heaters may be considered Trivial and Insignificant.

Applicable Requirements

Since these units are Trivial and Insignificant, there are no applicable requirements.

Monitoring Approach

Periodic Monitoring
No periodic monitoring is required since natural gas combustion results in negligible emissions and nearly zero percent opacity.

Compliance Assurance Monitoring [CAM]
For a unit to be subject to Compliance Assurance Monitoring (CAM), that unit must have a permit limit, a control device, and the potential to emit (PTE), pre-control, greater than 100 Ton/yr of any criteria pollutant or 10 Ton/yr of one Hazardous Air Pollutant (HAP) or 25 Ton/yr of all HAPs.

This regulation is not applicable since none of these units has a permit limit, the potential to emit greater than 100 Ton/yr, or a control device.

(12) Wellsite Emergency Flares

Each wellsite is proposed to have an emergency flare. This flare would be used to burn excess stock tank vapors, excess fuel gas, and/or the produced wellstream in the event of a plant shutdown.

Regulatory Applicability:

This section will summarize the regulatory applicability for these units.

Prevention of Significant Deterioration [PSD]
This facility is a 250-Ton source for the purposes of PSD since it is not one of the 28 source categories. Midroc has requested a facility-wide emissions limit of 245 Ton/yr for all criteria pollutants. Since the flares are the primary source of emissions, the flares will be limited to 245 Ton/yr for all flares. This limit will be met by monitoring the properties of, and the amount of, gas being flared.

ADEM Administrative Code Rule 335-3-5-.01(1-2)
This rule applies to sulfur emissions from petroleum production. Hydrogen Sulfide may not be emitted in a greater quantity than 0.10 grain per standard cubic foot (scf), or 160 ppmv, unless it is properly burned to maintain a ground concentration of less than 20 ppb beyond property limits, as averaged over a 30 minute period. Produced gas is not expected to exceed 160 ppmv. This regulation would be applicable to each well with this content or higher. Midroc has requested that this regulation be included in the permit in the event that the sulfur content is higher than expected. Combusting produced gas and stock tank vapors in the flare or transporting this gas to a treatment plant should minimize H_2S emissions.

Title V
These flares are subject to the requirements of Title V.

Applicable Requirements

Each of the flares should meet the following requirements:

1.	Each unit at this site is subject to all Title V source requirements.	*Rule 335-3-16*
2.	The total emissions from all sources at this facility shall not exceed 245 Ton/yr on NO_X, CO, VOC, and SO_2, as demonstrated by compliance with the following indicators for the emergency well flares: (a) Average gas properties shall be maintained at: (1) Heat content ≤ 1600 BTU/Scf (2) H_2S mole percent ≤ 1000 ppmv (3) Molecular Weight ≤ 28 lb/lb-mole (b) Total gas volume flared for all flares, as indicated by the gas production rate, shall be maintained at less than, or equal to, 750 MMScf/365-Day Period.	*Rule 335-3-14-.04 (Anti-PSD)*

Based on the criteria in requirement 2(a) and 2(b), the expected emissions may be found in Table 2.

Expected emissions:

	Pollutant (Ton/yr)				
Unit	**PM**	**SO_2**	**NO_X**	**CO**	**VOC**
Heater Treater	1.51E-02	2.69E-03	1.99E-01	1.67E-01	1.10E-02
Flare	0.00E+00	5.60E+00	3.61E+00	1.96E+01	1.96E+01
Total:	***1.82E-01***	***6.73E+01***	***4.57E+01***	***2.38E+02***	***2.35E+02***

Table 2: Total Potential Facility Emissions (Ton/yr)

3. Each process gas stream containing more than 0.10 of a grain of hydrogen sulfide per Scf shall not be emitted into the atmosphere unless it is properly burned to maintain the ground level concentrations of hydrogen sulfide to less than twenty (20) parts per billion beyond plant property limits, averaged over a thirty (30) minute period. *Rule 335-3-5-.03(2)*

4. No person shall cause or permit the Sulfur Oxide emissions from any facility designed to dispose of or process natural gas or refinery gas containing more than 10 grains of Hydrogen Sulfide per standard cubic foot to exceed 245 Ton/yr. *Rule 335-3-5-.03(3)*

Expected emissions: $H_2S \leq 1$ ppbv offsite
$SO_2 < 67$ Ton/yr [See Table 2 above]

5. Each flare shall meet the requirements specified below: *Rule 335-3-4-.01(1)*
   (a) Except for one 6-minute period during any 60-minute period, the flare shall not discharge into the atmosphere particulate that results in an opacity greater than 20%, as determined by a 6-minute average.
   (b) At no time shall the flare discharge into the atmosphere particulate that results in an opacity greater than 40%, as determined by a 6-minute average.

Monitoring Approach

ADEM Rule 335-3-5-.03(2) Monitoring

Per ADEM Rule 335-3-5-.03(2), all process streams containing at least 0.10 grains H_2S [~162 ppmv] shall be burned such that the offsite H_2S concentration is 20 ppb or less, as averaged over a 30-minute period.

Offsite Concentration Periodic Monitoring
The requirement to maintain an off-site hydrogen sulfide concentration below a specific amount constitutes a facility wide emission cap and such limits are not considered to be an emission limitation that would trigger the applicability of Compliance Assurance Monitoring. Thus, periodic monitoring is applicable.

The periodic monitoring parameter chosen to indicate the off site hydrogen sulfide concentrations are being met shall be the presence of a flame or spark at the flare tip when off-gases are vented to the flare.

Burning Requirement Compliance Assurance Monitoring [CAM]
The requirement to burn sulfur-laden gas in the flare is considered to be a work practice and not an emission limitation. Per 40 CFR 64.5(b) a facility should submit a CAM plan with its renewal application for each unit not classified as a large Pollutant Specific Emission Unit (PSEU). A large PSEU is any unit which would be considered a major source even with the addition of the control device. Since this is an initial Title V permit and each of these flares lacks the potential to emit greater than 100 Ton/yr, post-control, CAM does not apply at this time.

NO_X, CO, SO_2, & VOC Periodic Monitoring
Table 2 shows that the bulk of the potential emissions are from the flares. Therefore, demonstrating compliance with the facility-wide limits based solely on the flares is justified. Periodic monitoring for the facility-wide limits for NO_X, CO, VOC, and SO_2 is applicable, and will be twofold. First, a quarterly gas sample will be taken from each well stream, or a common stream, if appropriate, and analyzed for heat content, sulfur content as H_2S, and overall molecular weight. If the results of this analysis exceeds the indicators of 1600 BTU/Scf, 1000 ppmv H_2S, and 28 lb/lb-mol used in the preparation of this document, a deviation will be deemed to have occurred, and a notification should be submitted to the Department. Second, Midroc will be required to minimize total flowrates of gas to the flares. For the purposes of this monitoring plan, if the well is not connected to a pipeline, all gas produced will be assumed to have been flared. The total gas flared may also not exceed 750 MMScf per consecutive 365 day period, and the daily volume of gas flared may not exceed 2 MMScf/Day. See the attached table for a summary of the monitoring plan.

Opacity Monitoring
Periodic monitoring for the opacity standard will be required during flaring events as described in the following table.

Each Emergency Flare

Monitoring approach:	*Periodic Monitoring*	*Periodic Monitoring*
I. Indicator	**Average well gas properties for each well flare**	**Total well gas flared**
A. Measurement approach	Well gas BTU content, H_2S content, and molecular weight shall be determined quarterly, or at a frequency determined by the Department.	Well gas production volume for each wellsite shall be monitored with a system capable of measuring and recording the flow rate and/or the parameters utilized for flow rate calculation or estimated utilizing material balances, computer simulations, special testing, etc. For the purposes of this monitoring plan, the well gas production volume shall be equated to the total well gas flared volume.
II. Indicator range	**Average well gas properties shall be ≤:** **Heat content of 1600 BTU/Scf,** **Sulfur content of 1000 ppmv H_2S, &** **Molecular weight of 28 lb Gas/lb-mole Gas**	**The total well gas flared volume shall not exceed 2 MMScf/Day AND 750 MMScf/rolling 365-day period**
	The gas property set points may be changed upon receipt of Department approval.	The maximum total well gas flared volume limits may be changed upon receipt of Department approval.
	A deviation is defined as when the periodic gas analysis results in one, or more, of the measured gas properties exceeding the allowed values.	A deviation is defined as when the maximum total well gas flared volume exceeds the allowed Daily volume ad/or the 365-Day rolling total.
	A deviation triggers an immediate inspection, corrective action, and reporting within 48 hours or two work days.	A deviation triggers an immediate inspection, corrective action, and reporting within 48 hours or two work days.
A QIP threshold	Not applicable	Not applicable
III. Performance criteria		
A. Data representiveness	Well gas properties measured shall be representative of the well gas stream fed to each well flare.	Well gas production volume monitors shall be located immediately upstream of each well flare and pipeline entrance.
	Provided multiple streams share a common flare and pipeline entrance,the gas analysis may be performed on the gas at this entrance.	Provided multiple production streams share a common flare and pipeline entrance, the well gas production monitor may be placed at this entrance.
	The well gas properties shall be averaged throughout the area.	
B. Verification of operational status	Not applicable	Not applicable

Each Emergency Flare

Monitoring approach:	*Periodic Monitoring*	*Periodic Monitoring*
I. Indicator	**Average well gas properties for each well flare**	**Total well gas flared**
C. QA/QC practices & criteria	Not applicable	The well gas production volume monitor shall be calibrated at a frequency in accordance with the manufacturer's specifications, other written procedures that provide adequate assurance that the device is calibrated accurately, or at least annually, whichever is more frequent. If the well production volume monitor fails its calibration tests, the well gas production volume monitor shall be taken out of service until repairs and/or replacements are made and a new calibration test is undertaken and passed.
D. Monitoring frequency	Well gas properties shall be analyzed once each quarter, unless otherwise approved by the Department.	Well gas production volumes shall be monitored continuously. The daily well gas flared volume shall be added to the well gas flared volumes for the previous 364 days.
Data collection procedure	Record: Each Occurrence: Well gas: a) BTU content, b) H_2S content, & c) Molecular Weight determination Area gas: a) BTU content, b) H_2S content, & c) Molecular Weight determination Date and results of each inspection and corrective actions taken.	Record: Daily Site gas flared volume (in MMscf/Day) Area gas flared volume (in MMScf/Day) Annual gas flared volume [in MMScf/365-Days] Record: Each Occurrence: Date and results of each inspection and corrective actions taken.
Averaging period	After each sample	Daily

Each Emergency Flare - Opacity

Monitoring approach:	*Periodic Monitoring*
I. Indicator	**Opacity**
A. Measurement approach	Provided the flare is being utilized to burn a gas stream other than the pilot light fuel gas stream, a daily visual emission observation on the flare shall be undertaken. Duration of each observation shall be >= 15 minutes and<= 60 minutes Each observation shall be conducted with either: Test Method 9 of 40 CFR Part 60 – OR – Test Method 22 of 40 CFR Part 60
II. Indicator range	**(1) No more than one 6-min. average opacity reading shall exceed 20%; OR, (2) No 6-min. average opacity reading shall exceed 40%; OR, (3) The accumulated time of observed visible emissions shall not exceed 12 minutes.** A deviation is defined as anytime the observed 6-minute average opacity exceeds 20% for the 2nd time, or 40% for the 1st time, when utilizing Method 9. A deviation is defined as anytime the accumulated time in which visible emissions were observed exceeds 12 minutes per observation when utilizing Method 22. A deviation triggers continued visible emissions observations at a frequency suitable to defining the duration of the visible emission deviation event. One observation shall be undertaken to establish the end of the visible emission deviation event. A deviation triggers an immediate inspection, corrective action, and reporting within 48 hours or two work days.
III. Performance criteria	
A. Monitoring frequency	Daily
Data collection procedure	Record: Daily Each 15 second observation reading Record: Each occurrence – Time, date and results of corrective actions taken
Averaging period	Six minutes

Wellsite Fixed Roof Storage Vessels

Each wellsite is equipped with (2) 16,800 gallon condensate storage tanks, (1) 16,800 gallon saltwater storage tank, and (1) 21,000 gallon power oil storage tank.

Regulatory Applicability:

This section will summarize the regulatory applicability for these units.

Prevention of Significant Deterioration [PSD]
This facility is a 250-Ton source for the purposes of PSD since it is not one of the 28 source categories. Midroc has requested a facility-wide emissions limit of 245 Ton/yr for all criteria pollutants. Since any vapors released in the tanks would be captured and sent either to the wellsite flare or to the pipeline, these emissions have already been accounted for. Therefore, monitoring for the flare will be sufficient.

ADEM Administrative Code Rule 335-3-6-.03
This regulation applies to the loading and storage of volatile organic compounds. Per Rule 335-3-6-.03(4), this regulation does not apply to crude petroleum produced, separated, treated, or stored in the field. Since these tanks each store crude petroleum at the production source in the field, this regulation does not apply.

ADEM Administrative Code Rule 335-3-6-.04
This regulation applies to fixed roof petroleum liquid storage tanks. Per Rule 335-3-6-.03(3)(b), this regulation does not apply to storage tanks with a capacity less than 423,000 gallons, and used to store crude petroleum oil prior to custody transfer. Since these tanks each store crude oil prior to custody transfer, this regulation does not apply.

40 CFR 60 Subpart K_b
This regulation applies to VOC tanks constructed after July 12, 1984. Per §60.110b(d)(4), vessels with a design storage capacity of less than, or equal to, 1590 m^3 (420,000 gallons) used for petroleum or condensate stored, treated, or processed prior to custody transfer are exempt from this regulation. Each of the tanks at these sites has a volume of less than 420,000 gallons, and stores condensate prior to custody transfer. Therefore, these tanks are exempt from this regulation.

Title V
These units are subject to this regulation. However, as mentioned earlier, vapors from these tanks are captured and sent to the flare. Therefore, compliance with the flare requirements is sufficient.

Applicable Requirements

There are no applicable requirements to these tanks.

Monitoring Approach

There is no monitoring required for these tanks. However, it should be noted that each of these tanks is equipped with a vapor recovery system. This system will capture tank vapors and route them either to the pipeline or the flare.

Appendix A: Emissions Calculations

NOTE: These Calculations are being included for the sake of completeness and to show the total site potential emissions.

Part I: Heater Treaters

Table A-1 shows the AP-42 factors for potential emissions from a natural gas-fired combustion source. In this case, these values apply to the twelve (12) heater treaters located throughout the area.

Pollutant	SO_2	NO_X	CO	PM	VOC
AP-42 Factor (lb/MMscf)	0.6	100	84	7.6	5.5

Table A- 1: AP-42 Factors in lb/MMScf

These factors were used by Midroc in their potential emissions computations, except for SO_2, in which they based their computations on actual data. However, Midroc only computed their emissions for a 20 week operation. Thus, all computations performed here will be on a 52 week basis.

Equation I was used to generate the results in Table A-2:

$$\text{Amount Pollutant} = \frac{(\text{AP - 42 Factor (in lb/MMscf)}) * (\text{Rated Heat Capacity (in MMBTU/hr)})}{(\text{Heat Content (in MMBTU/MMscf)})}$$

[Equation I]

Here, the amount of pollutant is in lb/hr. The AP-42 Factors are listed in Table A-1. The heat content for the sweet natural gas used as fuel is approximately 1080 MMBTU/MMScf. In the case of an alternative emergency fuel being utilized, the emissions would be different. Table A-2 lists the potential emissions for each heater; the total shown is for all heaters. That is, for twelve (12) 0.5 MMBTU/hr Heater Treaters.

	Pollutant (lb/hr)				
Unit	PM	SO_2	NO_X	CO	VOC
Heater Treater	3.45E-03	2.73E-04	4.55E-02	3.82E-02	2.50E-03
Total :	***4.15E-02***	***3.27E-03***	***5.45E-01***	***4.58E-01***	***3.00E-02***

Table A- 2: Potential Emissions of Criteria Pollutants for the Heaters in lb/hr

Multiplying the results in Table A-2 by 8760 hr/yr and dividing by 2000 lb/Ton yields Table A-3.

	Pollutant (Ton/yr)				
Unit	PM	SO_2	NO_X	CO	VOC
Heater Treater	1.51E-02	1.19E-03	1.99E-01	1.67E-01	1.10E-02
Total:	***1.82E-01***	***1.43E-02***	***2.39E+00***	***2.01E+00***	***1.31E-01***

Table A- 3: Potential Emissions of Criteria Pollutants for the Heaters in Ton/yr

The actual SO_2 values are higher than those shown in Table A-3. Midroc calculated those values based on Equation II:

$$\text{Amount } SO_2 = (1.689 \text{ lb/Mscf}) * (\text{Mole \% } H_2S) * (\text{Flowrate (in Mscf/hr)})$$

[Equation II]

Converting, 1 Mscf equals 1000 standard cubic feet, which is obtained with Equation III:

$$\text{Flowrate (in Mscf/hr)} = \frac{(\text{Rated Heat Capacity (in BTU/hr)})}{(\text{Heat Content (in BTU/scf)}) * (1000 \text{ scf/Mscf})}$$

[Equation III]

The H_2S Mole percent is based on pipeline-quality natural gas. Table A-4 shows the calculated SO_2 potential emissions per well in both lb/hr and Ton/yr for a 52 week year for each 0.5 MMBTU/hr heater treater. The Total shown is the total for all twelve (12) heaters.

Unit	Mcf/hr	H_2S mole %	SO_2 (lb/hr)	SO_2 (Ton/yr)
Heater Treater	0.4545	0.0008	6.14E-04	2.69E-03
	Total Pollutant:		***7.37E-03***	***3.23E-02***

Table A- 4: Potential SO_2 Emissions from the Heaters

The potential SO_2 emissions in Table A-4 are clearly higher than those shown in Table A-3. Table A-5, therefore, is a composite of the SO_2 emissions from Table A-4 and the emissions for the other pollutants from Table A-3 for each heating unit. The total shown is for all heating units.

	Pollutant (Ton/yr)				
Unit	**PM**	**SO_2**	**NO_X**	**CO**	**VOC**
Heater Treater	1.51E-02	2.69E-03	1.99E-01	1.67E-01	1.10E-02
Total:	***1.82E-01***	***3.23E-02***	***2.39E+00***	***2.01E+00***	***1.31E-01***

Table A- 5: Potential Emissions for Criteria Pollutants for the Heaters

Part II: Flares

The emergency well flare calculations will be based on a total gas production rate of 2,000,000 Scf/day for all twelve (12) wells. Assuming that all of the gas is sent to the flare, then 6944 scf/hr of gas would be burned per flare. There are 1000 scf/Mscf, which converts to flowrate of 0.6944 Mscf/hr per emergency well flare.

The following gas properties from well test data will be used as the basis of the potential emissions calculations for the twelve (12) wells being considered in this analysis:

1. Heat content: 1600 BTU/Scf
2. Sulfur content: 1000 ppmv (0.1 mole percent) H_2S
3. Gas molecular weight: 28 lb/lb-mole

In addition, a VOC mass fraction of 0.40 percent was assumed for the gas, with a 98% destruction efficiency for each flare.

For a Flare, the amount of CO and NO_X produced is shown in Equation IV:

$$\text{Amount Pollutant} = \frac{(\text{AP - 42 Factor (in lb/MMBTU)}) * (\text{Rated Heat Capacity (in BTU/hr)})}{(1000000\ \text{BTU/MMBTU})}$$

[Equation IV]

The AP-42 Factors for flares from Table 13.5-1 of the Industrial Flares Section are 0.37 lb/MMBTU for CO and 0.068 lb/MMBTU for NO_X. Now, recalling Equation III from Part A, the flowrate is simply a ratio of the Rated Heat Capacity of the piece of equipment, in this case the flare, to the Heat Content of the gas stream. Therefore, the Rated Heat Capacity for each well flare may be computed by multiplying the flowrate (in scf/hr) by the gas Heat Content as shown in Equation V:

$$\text{Rated Heat Capacity (in BTU/hr)} = (\text{Heat Content (in BTU/scf)}) * (\text{Flowrate (in scf/hr)})$$

[Equation V]

Table A-6 shows the results for CO and NO_X if the entire gas stream is burned in each flare. Results are shown in both lb/hr and Ton/52 week year for all wells.

	Pollutant (lb/hr)		Pollutant (Ton/yr)	
Unit	CO	NO_X	CO	NO_X
Flare	4.48E+00	8.24E-01	1.96E+01	3.61E+00
Total:	***4.93E+01***	***9.07E+00***	***1.96E+01***	***3.61E+00***

Table A- 6: Potential Emissions for NO_X & CO

Equation II may be used to compute the amount of SO_2 released through the flare. As mentioned earlier, the flowrate to each well flare would be 83.333 Mscf/hr. Table A-7 shows the amount of potential SO_2 emissions per flare site.

Unit	SO_2 (lb/hr)	SO_2 (Ton/yr)
Flare	1.28E+00	5.60E+00
Total:	***1.41E+01***	***6.16E+01***

Table A- 7: Potential SO_2 Emissions from the Flares

The potential VOC emissions calculated using Equation VI in order to obtain the results displayed in Table A-8, where the flowrate is the same as the flowrate used in the calculations for Table A-6:

$$\text{VOC Emissions} = \left(\frac{\text{Flowrate (Scf/hr)} * 28 \text{ lb/lbmol}}{380 \text{ scf/lbmol}} \right) * 0.44 * (1 - 0.98)$$

[Equation VI]

The results in Table A-8 are for each flare. The Total is for all twelve (12) emergency well flares.

Unit	VOC (lb/hr)	VOC (Ton/yr)
Flare	4.47E+00	1.96E+01
Total:	***4.91E+01***	***2.15E+02***

Table A- 8: Potential VOC Emissions from the Flares

Table A-9 is a composite of Tables A-6, A-7 and A-8. It shows the total potential emissions for the criteria pollutants in Ton/year for all emergency well flares.

	Pollutant (Ton/yr)			
Unit	**SO_2**	**NO_X**	**CO**	**VOC**
Flare	5.60E+00	3.61E+00	1.96E+01	1.96E+01
Total:	***6.16E+01***	***3.97E+01***	***2.16E+02***	***2.15E+02***

Table A- 9: Potential Emissions for Criteria Pollutants from the Flares

Part III: Facility Total

Table A-10 summarizes the emissions for each unit at one wellsite. The total is for all twelve (12) wellsites.

	Pollutant (Ton/yr)				
Unit	**PM**	**SO_2**	**NO_X**	**CO**	**VOC**
Heater Treater	1.51E-02	2.69E-03	1.99E-01	1.67E-01	1.10E-02
Flare	0.00E+00	5.60E+00	3.61E+00	1.96E+01	1.96E+01
Total:	***1.82E-01***	***6.73E+01***	***4.57E+01***	***2.38E+02***	***2.35E+02***

Table A- 10: Total Potential Emissions for Criteria Pollutants

Table A-10 is reproduced as Table 2 above.

Appendix B: Draft Permit

ADEM
Alabama Department of Environmental Management

MAJOR SOURCE OPERATING PERMIT

Permitee: **Midroc Operating Company**

Facility Name: **Cedar Creek, Area No. 8**

Facility No.: 103-0031

Location: Sec. 13, 14, 15, 22, 23, & 24, T5N, R13E, Conecuh County, Alabama

In accordance with and subject to the provisions of the Alabama Air Pollution Control Act of 1971, as amended, Ala. Code 1975, §§22-28-1 to 22-28-23 (2006 Rplc. Vol.) (the "AAPCA") and the Alabama Environmental Management Act, as amended, Ala. Code 1975, §§22-22A-1 to 22-22A-15, (2006 Rplc. Vol.) and rules and regulations adopted thereunder, and subject further to the conditions set forth in this permit, the Permittee is hereby authorized to construct, install and use the equipment, device or other article described above.

*Pursuant to the **Clean Air Act of 1990**, all conditions of this permit are federally enforceable by EPA, the Alabama Department of Environmental Management, and citizens in general. Those provisions which are not required under the **Clean Air Act of 1990** are considered to be state permit provisions and are not federally enforceable by EPA and citizens in general. Those provisions are contained in separate sections of this permit.*

Issuance Date: *DRAFT*

Expiration Date: *DRAFT*

Alabama Department of Environmental Management

General Permit Provisos

Federally Enforceable Provisos	Regulations
1. Transfer This permit is not transferable, whether by operation of law or otherwise, either from one location to another, from one piece of equipment to another, or from one person to another, except as provided in Rule 335-3-16-.13(1)(a)5.	Rule 335-3-16-.02(6)
2. Renewals An application for permit renewal shall be submitted at least six (6) months, but not more than eighteen (18) months, before the date of expiration of this permit. The source for which this permit is issued shall lose its right to operate upon the expiration of this permit unless a timely and complete renewal application has been submitted within the time constraints listed in the previous paragraph.	Rule 335-3-16-.12(2)
3. Severability Clause The provisions of this permit are declared to be severable and if any section, paragraph, subparagraph, subdivision, clause, or phrase of this permit shall be adjudged to be invalid or unconstitutional by any court of competent jurisdiction, the judgment shall not affect, impair, or invalidate the remainder of this permit, but shall be confined in its operation to the section, paragraph, subparagraph, subdivision, clause, or phrase of this permit that shall be directly involved in the controversy in which such judgment shall have been rendered.	Rule 335-3-16-.05(e)
4. Compliance (a) The permittee shall comply with all conditions of ADEM Admin. Code 335-3. Noncompliance with this permit will constitute a violation of the Clean Air Act of 1990 and ADEM Admin. Code 335-3 and may result in an enforcement action; including but not limited to, permit termination, revocation and reissuance, or modification; or denial of a permit renewal application by the permittee.	Rule 335-3-16-.05(f)
(b) The permittee shall not use as a defense in an enforcement action that maintaining compliance with conditions of this permit would have required halting or reducing the permitted activity.	Rule 335-3-16-.05(g)

General Permit Provisos

Federally Enforceable Provisos	Regulations
5. Termination for Cause This permit may be modified, revoked, reopened, and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance will not stay any permit condition.	Rule 335-3-16-.05(h)
6. Property Rights The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege.	Rule 335-3-16-.05(i)
7. Submission of Information The permittee must submit to the Department, within 30 days or for such other reasonable time as the Department may set, any information that the Department may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. Upon receiving a specific request, the permittee shall also furnish to the Department copies of records required to be kept by this permit.	Rule 335-3-16-.05(j)
8. Economic Incentives, Marketable Permits, and Emissions Trading No permit revision shall be required, under any approved economic incentives, marketable permits, emissions trading and other similar programs or processes for changes that are provided for in this permit.	Rule 335-3-16-.05(k)
9. Certification of Truth, Accuracy, and Completeness: Any application form, report, test data, monitoring data, or compliance certification submitted pursuant to this permit shall contain certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate and complete.	Rule 335-3-16-.07(a)

General Permit Provisos

Federally Enforceable Provisos	Regulations
10. Inspection and Entry	
Upon presentation of credentials and other documents as may be required by law, the permittee shall allow authorized representatives of the Alabama Department of Environmental Management and EPA to conduct the following:	Rule 335-3-16-.07(b)
(a) Enter upon the permittee's premises where a source is located or emissions-related activity is conducted, or where records must be kept pursuant to the conditions of this permit;	
(b) Review and/or copy, at reasonable times, any records that must be kept pursuant to the conditions of this permit;	
(c) Inspect, at reasonable times, this facility's equipment (including monitoring equipment and air pollution control equipment), practices, or operations regulated or required pursuant to this permit;	
(d) Sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with this permit or other applicable requirements.	
11. Compliance Provisions	
(a) The permittee shall continue to comply with the applicable requirements with which the company has certified that it is already in compliance.	Rule 335-3-16-.07(c)
(b) The permittee shall comply in a timely manner with applicable requirements that become effective during the term of this permit.	
12. Compliance Certification	
A compliance certification shall be submitted annually within 60 days of the anniversary date of the issuance of this permit.	Rule 335-3-16-.07(e)
(a) The compliance certification shall include the following:	

Federally Enforceable Provisos	Regulations
(1) The identification of each term or condition of this permit that is the basis of the certification; (2) The compliance status; (3) The method(s) used for determining the compliance status of the source, currently and over the reporting period consistent with Rule 335-3-16-.05(c) (Monitoring and Recordkeeping Requirements); (4) Whether compliance has been continuous or intermittent; (5) Such other facts as the Department may require to determine the compliance status of the source; (b) The compliance certification shall be submitted to: Alabama Department of Environmental Management Air Division P.O. Box 301463 Montgomery, AL 36130-1463 and to: Air and EPCRA Enforcement Branch EPA Region IV 61 Forsyth Street, SW Atlanta, GA 30303	
13. Reopening for Cause Under any of the following circumstances, this permit will be reopened prior to the expiration of the permit:	Rule 335-3-16-.13(5)

Federally Enforceable Provisos	Regulations
(a) Additional applicable requirements under the Clean Air Act of 1990 become applicable to the permittee with a remaining permit term of three (3) or more years. Such a reopening shall be completed not later than eighteen (18) months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which this permit is due to expire.	
(b) Additional requirements (including excess emissions requirements) become applicable to an affected source under the acid rain program. Upon approval by the Administrator, excess emissions offset plans shall be deemed to be incorporated into this permit.	
(c) The Department or EPA determines that this permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of this permit.	
(d) The Administrator or the Department determines that this permit must be revised or revoked to assure compliance with the applicable requirements.	
14. Additional Rules and Regulations	
This permit is issued on the basis of Rules and Regulations existing on the date of issuance. In the event additional Rules and Regulations are adopted, it shall be the permit holder's responsibility to comply with such rules.	§22-28-16(d), Code of Alabama 1975, as amended
15. Equipment Maintenance or Breakdown	
(a) In the case of shutdown of air pollution control equipment (which operates pursuant to any permit issued by the Director) for necessary scheduled maintenance, the intent to shut down such equipment shall be reported to the Director at least twenty-four (24) hours prior to the planned shutdown, unless such shutdown is accompanied by the shutdown of the source which such equipment is intended to control. Such prior notice shall include, but is not limited to the following:	Rule 335-3-1-.07(1) & (2)

Federally Enforceable Provisos	Regulations

(1) Identification of the specific facility to be taken out of service as well as its location and permit number;

(2) The expected length of time that the air pollution control equipment will be out of service;

(3) The nature and quantity of emissions of air contaminants likely to occur during the shutdown period;

(4) Measures such as the use of off-shift labor and equipment that will be taken to minimize the length of the shutdown period;

(5) The reasons that it would be impossible or impractical to shut down the source operation during the maintenance period.

(b) In the event that there is a breakdown of equipment or upset of process in such a manner as to cause, or is expected to cause, increased emissions of air contaminants which are above an applicable standard, the person responsible for such equipment shall notify the Director within 24 hours or the next working day and provide a statement giving all pertinent facts, including the estimated duration of the breakdown. The Director shall be notified when the breakdown has been corrected.

16. Operation of Capture and Control Devices

All air pollution control devices and capture systems for which this permit is issued shall be maintained and operated at all times in a manner so as to minimize the emissions of air contaminants. Procedures for ensuring that the above equipment is properly operated and maintained so as to minimize the emission of air contaminants shall be established.

§22-28-16(d), Code of Alabama 1975, as amended

General Permit Provisos

Federally Enforceable Provisos	Regulations
17. Obnoxious Odors	
This permit is issued with the condition that, should obnoxious odors arising from the plant operations be verified by Air Division inspectors, measures to abate the odorous emissions shall be taken upon a determination by the Alabama Department of Environmental Management that these measures are technically and economically feasible.	Rule 335-3-1-.08
18. Fugitive Dust	
(a) Precautions shall be taken to prevent fugitive dust emanating from plant roads, grounds, stockpiles, screens, dryers, hoppers, ductwork, etc.	Rule 335-3-4-.02
(b) Plant or haul roads and grounds will be maintained in the following manner so that dust will not become airborne. A minimum of one, or a combination, of the following methods shall be utilized to minimize airborne dust from plant or haul roads and grounds:	
(1) By the application of water any time the surface of the road is sufficiently dry to allow the creation of dust emissions by the act of wind or vehicular traffic;	
(2) By reducing the speed of vehicular traffic to a point below that at which dust emissions are created;	
(3) By paving;	
(4) By the application of binders to the road surface at any time the road surface is found to allow the creation of dust emissions;	
Should one, or a combination, of the above methods fail to adequately reduce airborne dust from plant or haul roads and grounds, alternative methods shall be employed, either exclusively or in combination with one or all of the above control techniques, so that dust will not become airborne. Alternative methods shall be approved by the Department prior to utilization.	

General Permit Provisos

Federally Enforceable Provisos	Regulations
19. Additions and Revisions	
Any modifications to this source shall comply with the modification procedures in Rules 335-3-16-.13 or 335-3-16-.14.	Rule 335-3-16-.13 & Rule 335-3-16-.13.14
20. Recordkeeping Requirements	
(a) Records of required monitoring information of the source shall include the following:	Rule 335-3-16-.05(c)2.
(1) The date, place, and time of all sampling or measurements;	
(2) The date analyses were performed;	
(3) The company or entity that performed the analyses;	
(4) The analytical techniques or methods used;	
(5) The results of all analyses; and	
(6) The operating conditions that existed at the time of sampling or measurement.	
(b) Retention of records of all required monitoring data and support information of the source for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation and copies of all reports required by the permit	
21. Reporting Requirements	
(a) Reports to the Department of any required monitoring shall be submitted at least every 6 months. All instances of deviations from permit requirements must be clearly identified in said reports. All required reports must be certified by a responsible official consistent with Rule 335-3-16-.04(9).	Rule 335-3-16-.05(c)(3).

Federally Enforceable Provisos	Regulations
(b) Deviations from permit requirements shall be reported within 48 hours or 2 working days of such deviations, including those attributable to upset conditions as defined in the permit. The report will include the probable cause of said deviations, and any corrective actions or preventive measures that were taken.	
22. Emission Testing Requirements	
Each point of emission which requires testing will be provided with sampling ports, ladders, platforms, and other safety equipment to facilitate testing performed in accordance with procedures established by Part 60 of Title 40 of the Code of Federal Regulations, as the same may be amended or revised.	Rule 335-3-1-.05(3) & Rule 335-3-1-.04(1)
The Air Division must be notified in writing at least 10 days in advance of all emission tests to be conducted and submitted as proof of compliance with the Department's air pollution control rules and regulations. To avoid problems concerning testing methods and procedures, the following shall be included with the notification letter:	
(1) The date the test crew is expected to arrive, the date and time anticipated of the start of the first run, how many and which sources are to be tested, and the names of the persons and/or testing company that will conduct the tests.	Rule 335-3-1-.04
(2) A complete description of each sampling train to be used, including type of media used in determining gas stream components, type of probe lining, type of filter media, and probe cleaning method and solvent to be used (if test procedures require probe cleaning).	
(3) A description of the process(es) to be tested including the feed rate, any operating parameters used to control or influence the operations, and the rated capacity.	
(4) A sketch or sketches showing sampling point locations and their relative positions to the nearest upstream and downstream gas flow disturbances.	

Federally Enforceable Provisos	Regulations
A pretest meeting may be held at the request of the source owner or the Air Division. The necessity for such a meeting and the required attendees will be determined on a case-by-case basis. All test reports must be submitted to the Air Division within 30 days of the actual completion of the test unless an extension of time is specifically approved by the Air Division.	Rule 335-3-1-.04
23. Payment of Emission Fees Annual emission fees shall be remitted each year according to the fee schedule in ADEM Admin. Code R. 335-1-7-.04.	Rule 335-1-7-.04
24. Other Reporting and Testing Requirements Submission of other reports regarding monitoring records, fuel analyses, operating rates, and equipment malfunctions may be required as authorized in the Department's air pollution control rules and regulations. The Department may require emission testing at any time.	Rule 335-3-1-.04(1)
25. Title VI Requirements (Refrigerants) Any facility having appliances or refrigeration equipment, including air conditioning equipment, which use Class I or Class II ozone-depleting substances as listed in 40 CFR Part 82, Subpart A, Appendices A and B, shall service, repair, and maintain such equipment according to the work practices, personnel certification requirements, and certified recycling and recovery equipment specified in 40 CFR Part 82, Subpart F. No person shall knowingly vent or otherwise release any Class I or Class II substance into the environment during the repair, servicing, maintenance, or disposal of any device except as provided in 40 CFR Part 82, Subpart F. The responsible official shall comply with all reporting and recordkeeping requirements of 40 CFR 82.166. Reports shall be submitted to the US EPA and the Department as required.	40 CFR Part 82

General Permit Provisos

Federally Enforceable Provisos	Regulations
26. Chemical Accidental Prevention Provisions	
If a chemical listed in Table 1 of 40 CFR Part 68.130 is present in a process in quantities greater than the threshold quantity listed in Table 1, then: (a) The owner or operator shall comply with the provisions in 40 CFR Part 68. (b) The owner or operator shall submit one of the following: (1) A compliance schedule for meeting the requirements of 40 CFR Part 68 by the date provided in 40 CFR Part 68 § 68.10(a) or, (2) A certification statement that the source is in compliance with all requirements of 40 CFR Part 68, including the registration and submission of the Risk Management Plan.	40 CFR Part 68
27. Display of Permit	
This permit shall be kept under file or on display at all times at the site where the facility for which the permit is issued is located and will be made readily available for inspection by any or all persons who may request to see it.	Rule 335-3-14-.01(1)(d)
28. Circumvention	
No person shall cause or permit the installation or use of any device or any means which, without resulting in reduction in the total amount of air contaminant emitted, conceals or dilutes any emission of air contaminant which would otherwise violate the Division 3 rules and regulations.	Rule 335-3-1-.10
29. Visible Emissions	
Unless otherwise specified in the Unit Specific provisos of this permit, any source of particulate emissions shall not discharge more than one 6-minute average opacity greater than 20% in any 60-minute period. At no time shall any source discharge a 6-minute average opacity of particulate emissions greater than 40%. Opacity will be determined by 40 CFR Part 60, Appendix A, Method 9, unless otherwise specified in the Unit Specific provisos of this permit.	Rule 335-3-4-.01(1)

General Permit Provisos

Federally Enforceable Provisos	Regulations
30. Fuel-Burning Equipment	
(a) Unless otherwise specified in the Unit Specific provisos of this permit, no fuel-burning equipment may discharge particulate emissions in excess of the emissions specified in Part 335-3-4-.03.	Rule 335-3-4-.03
(b) Unless otherwise specified in the Unit Specific provisos of this permit, no fuel-burning equipment may discharge sulfur dioxide emissions in excess of the emissions specified in Part 335-3-5-.01.	Rule 335-3-5-.01
31. Process Industries – General	
Unless otherwise specified in the Unit Specific provisos of this permit, no process may discharge particulate emissions in excess of the emissions specified in Part 335-3-4-.04.	Rule 335-3-4-.04
32. Averaging Time for Emission Limits	
Unless otherwise specified in the permit, the averaging time for the emission limits listed in this permit shall be the nominal time required by the specific test method.	Rule 335-3-1-.05

Summary Page for Emergency Well Flares

Permitted Operating Schedule: **24** Hours/Day x **365** Days/Year = **8760** Hours/Year

Emission limitations:

Emission Point #	Description	Pollutant	Emission Limit	Regulation
13NWA, 1313A, 1414A, 1415A, 15SEA, 2208A, 2216A, 22NEA, 2303A, 23SEA, & 24NWA	Emergency Well Flares at Wells: 13-NW, 13-13, 14-14, 14-15/23-2, 22-8/23-12,23-3, 23-SE, & 24-NW	SO_2	< = 245 Ton/yr*	Rule 335-3-14-.04 (Anti-PSD)
		NO_X	< = 245 Ton/yr*	Rule 335-3-14-.04 (Anti-PSD)
		VOC	< = 245 Ton/yr*	Rule 335-3-14-.04 (Anti-PSD)
		CO	< = 245 Ton/yr*	Rule 335-3-14-.04 (Anti-PSD)
		H_2S	20 ppbv of H_2S off site	Rule 335-3-5-.03(2)
		Opacity	< 20%	Rule 335-3-4-.01(1)

* As indicated by compliance with the following:

Average Gas Properties:	
Heat Content	< = 1600 BTU/Scf
H_2S Content	< = 1000 ppmv
Molecular Weight	< = 28 lb/lb-mole
Flare Feedrate:	< = 2 $\frac{\text{MMScf}}{\text{Day}}$
	< = 750 $\frac{\text{MMScf}}{\text{365-Days}}$

See Appendix C for a list of all other equipment at the Wellsites

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations
Applicability	
1. The flares share an enforceable limit in order to prevent the facility from being subject to the provisions of *ADEM Admin. Code R.* 335-3-14-.04, "Air Permits Authorizing Construction in Clean Air Areas" [Prevention of Significant Deterioration (PSD)].	Rule 335-14-.04
2. Each of these flares is subject to Rule 335-3-16.	Rule 335-3-16-.03
3. Each flare that burns gas that contains more than 0.10 grains of hydrogen (H_2S) per standard cubic foot (Scf) shall be subject to *ADEM Admin. Code R.* 335-3-5-.03.	Rule 335-3-5-.03(1)
Emission Standards	
1. The total emissions from the flares shall adhere to the following requirements:	Rule 335-3-14-.04 [Anti-PSD]
(a) Sulfur Dioxide (SO_2) emissions shall not exceed 245 Ton per year.	
(b) Nitrogen Oxide (NO_X) emissions shall not exceed 245 Ton per year.	
(c) Volatile Organic Compound (VOC) shall not exceed 245 Ton per year.	
(d) Carbon Monoxide (CO) shall not exceed 245 Ton per year.	
2. Compliance with proviso 1 of this section of this subpart of this permit shall be indicated by maintaining:	Rule 335-3-14-.04 [Anti-PSD]
(a) The average well gas properties at, or below:	
(1) Heat Content: 1600 BTU/Scf	
(2) H_2S Content: 1000 ppmv	
(3) Gas Molecular Weight: 28 lb/lb-mole	

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations
(b) The feedrate to the flares according to the following: (1) The total volume flared for the Area shall not exceed 2 MMScf/Day (2) The total volume flared for the Area shall not exceed 750 MMScf for any consecutive 365-Day period (3) The following definitions shall apply: (i) Area = All wellsites permitted herein (ii) Volume Flared = Volume Produced, when gas is not sent to a pipeline for processing or sale.	
(c) The setpoints in provisos 2(a) and 2(b) may be altered upon receipt of Department approval.	
(d) Each storage tank shall be equipped with a closed vent system to the flare, pipeline, or onsite fuel gas system.	
3. All process gas streams containing 0.10 of a grain of hydrogen sulfide per Scf shall be burned to the extent that the ground level concentrations of hydrogen sulfide shall be less than twenty (20) parts per billion beyond plant property limits, averaged over a thirty (30) minute period.	Rule 335-3-5-.03(2)
4. The emergency well flares shall meet the requirements specified in 4(a) and (b) of this section of this subpart.	Rule 335-3-4-.01(1)
(a) Except for one 6-minute period during any 60-minute period, the flare shall not discharge into the atmosphere particulate that results in an opacity greater than 20%, as determined by a 6-minute average.	

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations
(b) At no time shall the flare discharge into the atmosphere particulate that results in an opacity greater than 40%, as determined by a 6-minute average.	
Compliance and Performance Test Methods and Procedures	
1. For the purpose of demonstrating compliance with provisos 2(a) and 3 of the *emission standards* section of this subpart, each process stream that can be sent to a flare shall be tested in accordance to the requirements specified in proviso 1(a) and (b) of this section of this subpart.	Rule 335-3-16-.05(c)(1)(i) & Rule 335-3-1-.05
(a) The hydrogen sulfide content of each process stream shall be determined in accordance to the requirements specified in proviso 1(a)(1) and (2) of this section of this subpart.	
(1) Testing shall consist of capturing one representative sample of the stream at a frequency of at least quarterly;	
(2) The sample collected shall be analyzed utilizing the Tutwiler procedures found in §60.648 or the chromatographic analysis procedures found in ASTM E-260 or the stain tube procedures found in GPA 2377-86 or those provided by the stain tube manufacture. [Stream (H_2S Mole %)]	
(b) The volatile organic compound weight percent and BTU content and molecular weight of each process stream shall be determined in accordance to the requirements specified in proviso 1(b)(1) and (2) of this section of this subpart.	
(1) A representative sample of the stream shall be captured and analyzed at a frequency of at least quarterly.	

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations

(2) The sample collected shall be analyzed utilizing ASTM Analysis Method D1826-77, chromatographic analysis procedures found in 40 CFR Part 60 Appendix A, Method 18 or equivalent methods and procedures.

[Stream (Mole Wt)]
[Stream (VOC Wt %)]
[Stream (BTU/Scf]

(c) The H_2S and Btu content and gas molecular weight of the sour gas stream that is sent to the gathering system pipeline may be substituted for the determination in provisos 1(a) and 1(b).

(d) Provided multiple process streams can be sent to the flare, and it is possible to capture a common stream whose contents would be representative of all the streams, that common stream may be used instead of the individual process streams.

(e) Each process gas stream that has to be vented to the atmosphere shall be captured and sent to a flare so that it can be burned.

(1) Compliance shall be demonstrated by conducting a process flow design evaluation of the production facility in conjunction with a visual inspection of the facility.

(2) Except when vessels and equipment are being de-pressured and/or emptied and the reduced pressure will not allow flow of the gas to a control device, the venting to the atmosphere of any process gas stream that is subject to this proviso for a duration in excess of 15 continuous minutes shall be deemed a exceedance of requirements specified in proviso 2 of the *emission standards* section of this subpart.

(f) The frequency and methods of this testing may be modified upon receipt of Department approval.

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations
2. Compliance with proviso 2(b) of the *emission standards* section of this subpart of this permit shall be demonstrated by the installation of a continuous flowmeter that records the gas production volume. Other methods, such as engineering calculations, may be utilized with Department approval.	Rule 335-3-16-.05(a) & Rule 335-3-14-.04
Emission Monitoring	
1. Monitoring meeting the requirements specified in Appendix A of this permit shall be utilized for the emergency well flares.	Rule 335-3-16-.05(c)(1), Rule 335-3-1-.04, & Rule 335-3-16-.05(c)(1)(ii)
2. Compliance with proviso 4 of the *emission standards* section of this subpart of this permit shall be demonstrated by either:	
(a) A daily visual inspection of the flare shall be undertaken.	
(b) If during this inspection, visible emissions are observed, then a visible emissions observation as outlined in Appendix B shall be undertaken.	
Record Keeping and Reporting Requirements	
1. For the purpose of demonstrating compliance with provisos 1 through 4 of the *emission standards* section of this subpart, a monthly record of the information specified in provisos 1(a) through (e) of this section of this subpart shall be maintained and made available for inspection for each flare for a period of five (5) years.	Rule 335-3-16-.05(c)(2) & Rule 335-3-1-.04
(a) For each wellsite:	
(1) Site Daily Gas Flared [MMScf/Day]	
(2) A copy of the most recent gas analysis containing the following information:	
(i) Site Heat Content [BTU/Scf]	
(ii) Site Sulfur Content [mole % H_2S]	

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations
(iii) Site Gas Molecular Weight [lb/lb-mole] (b) For the facility: (1) Area Daily Gas Flared [MMScf/Day] = Σ Site Daily Gas Flared [MMScf/Day] (2) Area Annual Gas Flared [MMScf/365-Day] = Area Daily Gas Flared [MMScf/Day] + Σ Area Daily Gas Volume Flared [MMScf/Day] for previous 364 days (3) An average of the most recent gas analyses for each site containing the following information: (i) Average Area Heat Content [BTU/Scf] (ii) Average Area Sulfur Content [mole % H_2S] (iii) Average Area Gas Molecular Weight [lb/lb-mole] (c) The date, starting time, duration, and results of all flare visible emissions observations or flare inspections as described in proviso 2 of the *emission monitoring* section of this subpart of this permit. (d) The date, starting time, and duration of each deviation or exceedance of the requirements specified in provisos 2 through 4 of the *emission standards* section of this subpart along with the emissions, cause and corrective actions taken. (e) The frequency of the recordkeeping period may be altered upon receipt of Departmental approval.	
2. Periodic Monitoring Reports meeting the requirements specified in proviso 2(a) through (c) of this section of this subpart shall be submitted to the Department.	Rule 335-3-16-.05(c)(2) Rule 335-3-16-.05(c)(3)(i)

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations
(a) Each report shall identify each incidence of deviation from a permit term or condition including those that occur during startups, shutdowns, and malfunctions. (1) A deviation shall mean any instance in which emission limits, emission standards, and/or work practices were not complied with, as indicated by observations, data collection, and monitoring specified in this permit. Some examples of deviations are: (i) There was a failure to maintain the presence of a flame or igniter spark at the flare tip when a process gas stream could have been sent to it. (ii) There was a failure to take immediate corrective actions when a deviation was determined to have occurred. (iii) One, or more, process gas streams were vented to atmosphere for more than 15 consecutive minutes in duration. (iv) Any of the emission limits in proviso 1 of the *emission standards* section of this subpart of this permit were exceeded, but were less than 250 Ton/yr. (v) Process gas stream H_2S, and/or Btu content and/or the molecular weight exceeded the setpoints in proviso 2(a) of the *emission standards* section of this subpart of this permit. (vi) The flared gas flowrate exceeded the setpoint in proviso 2(b) of the *emission standards* section of this subpart of this permit	

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations
(vii) The 30-minute average offsite hydrogen sulfide concentration exceeded 20 ppbv, as determined by air quality modeling study.	
(viii) The opacity exceeded 20% for more that one 6-minute averaging period during any consecutive 60-mnute period.	
(ix) The opacity exceeded 40% during any 6-minute averaging period.	
(x) Visible emissions observations were not conducted for the required 12 minute duration when utilizing Method 22.	
(xi) Process gas stream H_2S, and/or Btu content was not determined at the appropriate frequency, or with the correct methods.	
(xii) Required monitoring was not conducted according to the specified monitoring plans.	
(xiii) Records were not kept appropriately.	
(xiv) Reports were not submitted appropriately.	
(2) For each deviation event, the following information shall be submitted.	
(i) Emission source description	
(ii) Permit requirement	
(iii) Date	
(iv) Starting time of pollutant or parameter	

Provisos for Emergency Well Flares

Federally Enforceable Provisos	Regulations
(v) Duration (vi) Actual quantity of pollutant or parameter (vii) Cause (viii) Actions taken to return to normal operating conditions (ix) Total operating hours of the affected source during the reporting period (x) Total hours of deviation events during the reporting period (xi) Total hours of deviation events that occurred during start ups, shut downs, and malfunctions during the reporting period	
(b) If no deviation event occurred during the reporting period, a statement that indicates there were no deviations from the permit requirements shall be included in the report.	
(c) Each report shall cover a calendar semi-annual period and shall be submitted within thirty days of the end reporting period.	
(d) The report content and format in proviso 2(a) through (c) of this section may be modified upon receipt of Departmental approval.	
3. Each deviation from the requirements specified in provisos 1 through 3 of the *emission standards* section of this subpart, including those that occur during start ups, shut downs, and malfunctions, shall be reported to the Department in a manner that complies with proviso 15(b) and 21(b) of the general proviso subpart of this permit.	Rule 335-3-16-.05(c)(3)(ii)

Appendix A: Monitoring for Emergency Flares

Each Emergency Flare

Monitoring approach:	*Periodic Monitoring*	*Periodic Monitoring*
I. Indicator	**Average well gas properties for each well flare**	**Total well gas flared**
A. Measurement approach	Well gas BTU content, H_2S content, and molecular weight shall be determined quarterly, or at a frequency determined by the Department.	Well gas production volume for each wellsite shall be monitored with a system capable of measuring and recording the flow rate and/or the parameters utilized for flow rate calculation or estimated utilizing material balances, computer simulations, special testing, etc. For the purposes of this monitoring plan, the well gas production volume shall be equated to the total well gas flared volume.
II. Indicator range	**Average well gas properties shall be ≤:** **Heat content of 1600 BTU/Scf,** **Sulfur content of 1000 ppmv H_2S, &** **Molecular weight of 28 lb Gas/lb-mole Gas** The gas property set points may be changed upon receipt of Department approval. A deviation is defined as when the periodic gas analysis results in one, or more, of the measured gas properties exceeding the allowed values. A deviation triggers an immediate inspection, corrective action, and reporting within 48 hours or two work days.	**The total well gas flared volume shall not exceed 2 MMScf/Day AND 750 MMScf/rolling 365-day period** The maximum total well gas flared volume limits may be changed upon receipt of Department approval. A deviation is defined as when the maximum total well gas flared volume exceeds the allowed Daily volume ad/or the 365-Day rolling total. A deviation triggers an immediate inspection, corrective action, and reporting within 48 hours or two work days.
A QIP threshold	Not applicable	Not applicable
III. Performance criteria		
A. Data representiveness	Well gas properties measured shall be representative of the well gas stream fed to each well flare. Provided multiple streams share a common flare and pipeline entrance,the gas analysis may be performed on the gas at this entrance.	Well gas production volume monitors shall be located immediately upstream of each well flare and pipeline entrance. Provided multiple production streams share a common flare and pipeline entrance, the well gas production monitor may be placed at this entrance.

Each Emergency Flare

Monitoring approach:	*Periodic Monitoring*	*Periodic Monitoring*
I. Indicator	**Average well gas properties for each well flare** The well gas properties shall be averaged throughout the area.	**Total well gas flared**
B. Verification of operational status	Not applicable	Not applicable
C. QA/QC practices & criteria	Not applicable	The well gas production volume monitor shall be calibrated at a frequency in accordance with the manufacturer's specifications, other written procedures that provide adequate assurance that the device is calibrated accurately, or at least annually, whichever is more frequent. If the well production volume monitor fails its calibration tests, the well gas production volume monitor shall be taken out of service until repairs and/or replacements are made and a new calibration test is undertaken and passed.
D. Monitoring frequency	Well gas properties shall be analyzed once each quarter, unless otherwise approved by the Department.	Well gas production volumes shall be monitored continuously. The daily well gas flared volume shall be added to the well gas flared volumes for the previous 364 days.
Data collection procedure	Record: Each Occurrence: Well gas: a) BTU content, b) H_2S content, & c) Molecular Weight determination Area gas: a) BTU content, b) H_2S content, & c) Molecular Weight determination Date and results of each inspection and corrective actions taken	Record: Daily Site gas flared volume (in MMscf/Day) Area gas flared volume (in MMScf/Day) Annual gas flared volume [in MMScf/365-Days] Record: Each Occurrence: Date and results of each inspection and corrective actions taken.
Averaging period	After each sample	Daily

Appendix B : Monitoring for Opacity for Emergency Well Flares

Each Emergency Flare - Opacity

Monitoring approach:	*Periodic Monitoring*
I. Indicator	**Opacity**
A. Measurement approach	Provided the flare is being utilized to burn a gas stream other than the pilot light fuel gas stream, a daily visual emission observation on the flare shall be undertaken. Duration of each observation shall be >= 15 minutes and<= 60 minutes Each observation shall be conducted with either: Test Method 9 of 40 CFR Part 60 – OR – Test Method 22 of 40 CFR Part 60
II. Indicator range	**(1) No more than one 6-min. average opacity reading shall exceed 20%; OR, (2) No 6-min. average opacity reading shall exceed 40%; OR, (3) The accumulated time of observed visible emissions shall not exceed 12 minutes.** A deviation is defined as anytime the observed 6-minute average opacity exceeds 20% for the 2nd time, or 40% for the 1st time, when utilizing Method 9. A deviation is defined as anytime the accumulated time in which visible emissions were observed exceeds 12 minutes per observation when utilizing Method 22. A deviation triggers continued visible emissions observations at a frequency suitable to defining the duration of the visible emission deviation event. One observation shall be undertaken to establish the end of the visible emission deviation event. A deviation triggers an immediate inspection, corrective action, and reporting within 48 hours or two work days.
III. Performance criteria	
A. Monitoring frequency	Daily
Data collection procedure	Record: Daily Each 15 second observation reading Record: Each occurrence – Time, date and results of corrective actions taken
Averaging period	Six minutes

Appendix C: Summary of Equipment at Wellsites (Includes Trivial & Insignificant Sources)

PERMIT NUMBER	DESCRIPTION OF EQUIPMENT, ARTICLE OR DEVICE
	13-NW oil & gas production & separation site [Generic]
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
13NWA	Closed vent system & flare
	CCL&T 13-13 oil & gas production & separation site
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
1313A	Closed vent system & flare
	CCL&T 14-14 oil & gas production & separation site
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
1414A	Closed vent system & flare
	CCL&T 14-15/CCL&T 23-2 oil & gas production & separation sites
	Two (2) - 0.5 MMBtu/Hr heater treaters
	Four (4) – 16,800 Gallon crude storage tank
	Two (2) – 16,800 Gallon salt water storage tank
	Two (2) – 21,000 Gallon power oil storage tank
1415A	Closed vent system & flare
	15-SE oil & gas production & separation site [Generic]
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
15SEA	Closed vent system & flare
	CCL&T 22-8/CCL&T 23-12 oil & gas production & separation sites
	Two (2) - 0.5 MMBtu/Hr heater treaters
	Four (4) – 16,800 Gallon crude storage tank
	Two (2) – 16,800 Gallon salt water storage tank
	Two (2) – 21,000 Gallon power oil storage tank
2208A	Closed vent system & flare
	22-SE oil & gas production & separation site [Generic]
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
22SEA	Closed vent system & flare

PERMIT NUMBER	DESCRIPTION OF EQUIPMENT, ARTICLE OR DEVICE
	22-NE oil & gas production & separation site [Generic]
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
22NEA	Closed vent system & flare
	CCL & T 23-3 oil & gas production & separation site
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
2303A	Closed vent system & flare
	23-SE oil & gas production & separation site [Generic]
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
23SEA	Closed vent system & flare
	24-NW oil & gas production & separation site [Generic]
	One (1) - 0.5 MMBtu/Hr heater treater
	Two (2) – 16,800 Gallon crude storage tank
	One (1) – 16,800 Gallon salt water storage tank
	One (1) – 21,000 Gallon power oil storage tank
24NWA	Closed vent system & flare